ATOMIC BALTIC

Atomic Threats In The Baltic Sea Region

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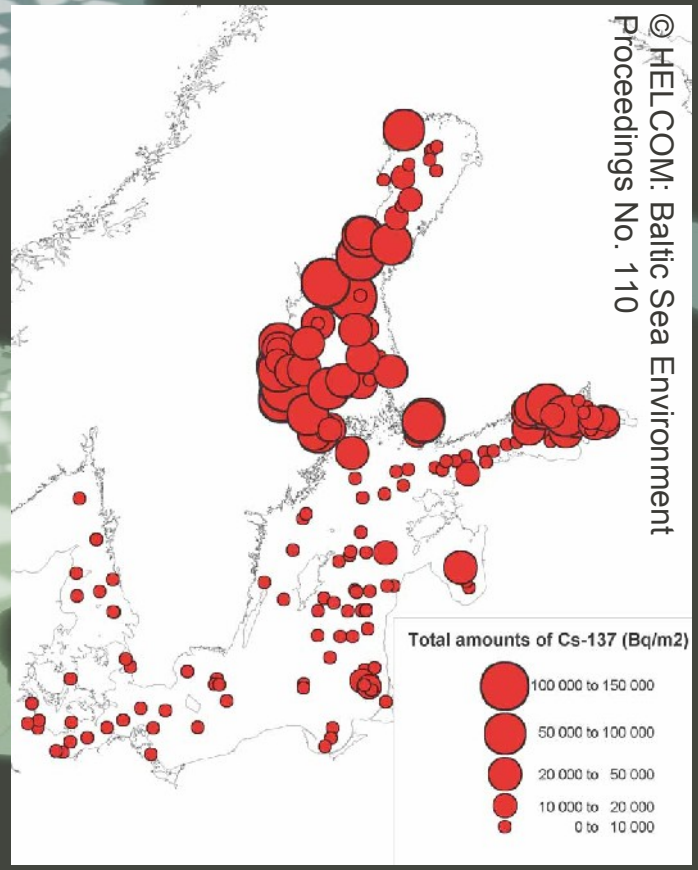
Baltic Sea – A unique community

The Baltic Sea is the world's **most radioactive sea**, HELSINKI COMMISSION reported in 2007.

- **highest concentrations** of manmade radiation compared to other water bodies in the world, e.g.:
  - → 40 times more Cs-137 than in Northeast Atlantic
  - → 10 times more Cs-137 than in North Sea
  - → sediments most rad.: Bothnian Sea & Gulf of Finland
- **only 1-2 % water exchange** with Atlantic per year, thus most radioactive particles remain & accumulate

Water makes the communities in the watershed of the Baltic Sea **close neighbours** - though some are about 1,000 kilometers away. The sea is a **food source** for millions of people, and an important **recreation area** for many more. And it is a transport medium for **poisonous emissions** from more than 60 atomic plants discharging pollutants to water and air. Thus, the Baltic Sea is connecting needs and interests of human populations of a wide area forming an **unique community**.

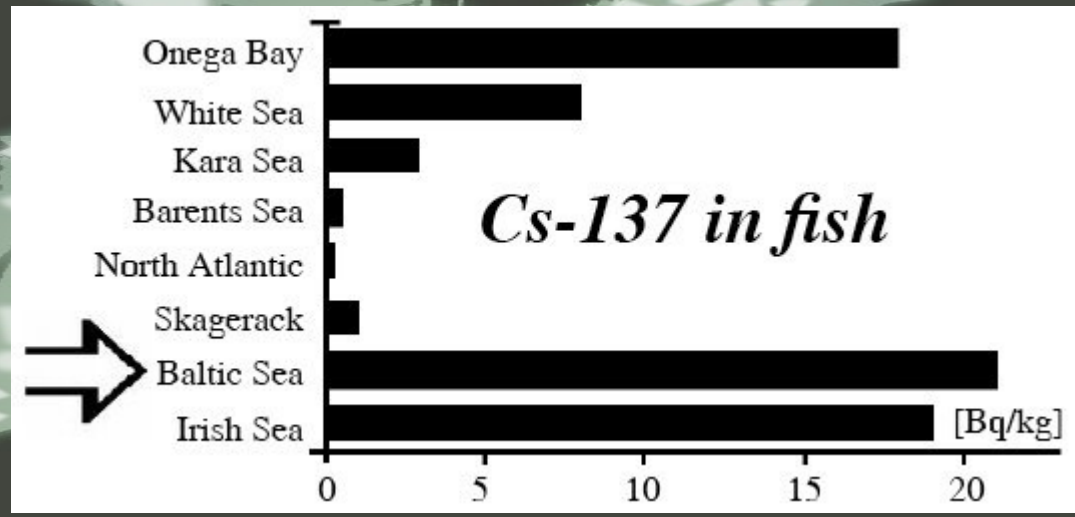
- 1980s estimated total concentrations in Baltic Sea sediments: 277 TBq Cs-137, 12 TBq Sr-90, 15 TBq Pu-239/Pu-240
- 1998 evaluation: 1,940-2,210 TBq Cs-137, 26 TBq Sr-90, 15.3 TBq Pu-239/Pu-240
  (based on reviewed data input of member states)
- early 2000s: 2,100-2,400 TBq Cs-137, 26 TBq Sr-90, 15,3 TBq Pu-239/240



Aspects of radioactive threats

Historic main polluters of the Baltic Sea:

- nuclear disaster in **Chernobyl** 1986 (82% Cs-137)
- '60s + '70s atmospheric **atomic weapons tests** (14% Cs-137)
- **Sellafield** plant's discharges to Irish Sea traceable in Baltic Sea (4% Cs-137)



today's polluters of the Baltic Sea:

- nuclear power plants (**NPPs**)
- atomic waste **repositories**
- **uranium mining** and exploration
- nuclear **shipments** across the sea
- **other facilities**

Radiation accidents impacting the Baltic Sea region

- 1974: explosion of radioactive gases tank at Leningrad I-1 NPP (RUS)
- 1974: incident at Ringhals-2 NPP (S)
- 1974: accident at Leningrad I-1 NPP with three people killed (RUS)
- 1975: fire at Greifswald NPP (GDR/D) – INES 3
- 1975: incident at Ringhals-1 and Ringhals-2 NPP (S)

- 1975: radiation leakage over one month at Leningrad I-1 NPP (RUS)
- 1976: sabotage attempt with explosive prevented at Ringhals NPP (S)
- 1976: fire at Leningrad NPP (RUS)
- 1979: fire at Leningrad NPP (RUS)
- 1986: nuclear disaster in Chernobyl (SU/UA) - INES 7
- 1989: accident at Greifswald NPP (GDR/D)
- 1990: accident at Leningrad I-1 NPP (RUS)

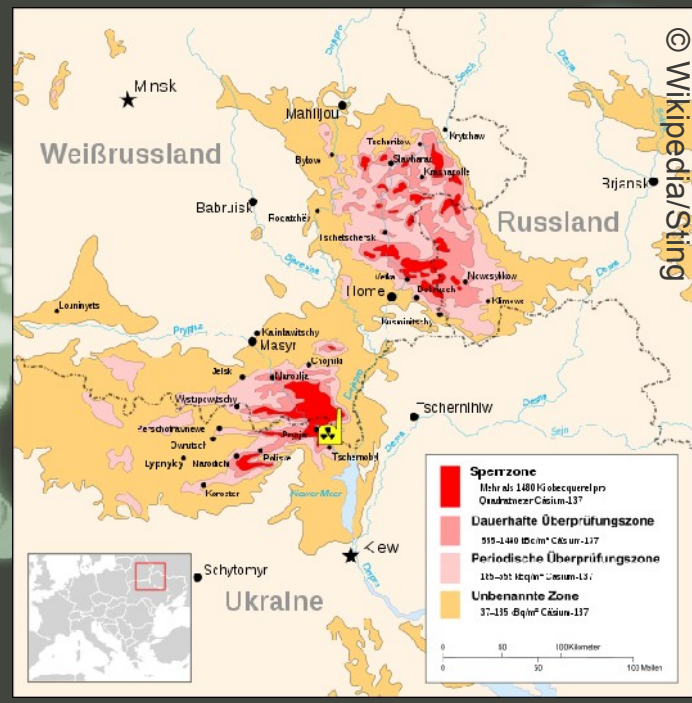
- 1991: accident at Leningrad I NPP (RUS)
- 1992: accident at Sosnovy Bor nuclear plant leaking radioactive gases and iodine (RUS)
- 1996: radiation leakage at Leningrad I NPP (RUS)
- 2000: incident at Leningrad I-1 NPP (RUS)
- 2000: radiation leakage at Leningrad I NPP (RUS)
- 2006: fire at Ringhals-3 NPP (S)
- 2006: incident at Forsmark NPP (S) – INES 2

- 2007: incident at Ringhals-3 NPP (S)
- 2007: incident at Forsmark NPP (S)
- 2009: incident at Leningrad I-3 NPP (RUS)
- 2011: incident at Oskarshamn-2 NPP (S)

This is an incomplete list of incidents and accidents. Additionally for Olkiluoto NPP (FIN): 94 x INES 1, 7 x INES 2 (1977-2008)

Chernobyl disaster

- Chernobyl NPP unit 4 exploded April 26, 1986
- located in Ukraine, close to Belarusian border
- 500,000 people + 485 villages relocated, >500,000 victims
- biggest Baltic Sea polluter; most affected marine area
- radioactive cloud travelled north -> strong deposition



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- Cs-137 first dispersed directly onto sea surface
- radionuclides came from entire drainage area and from surrounding terrestrial + coastal areas due to runoff, river discharges + coastal currents
- major radioactivity deposited in sediments
- total input from Chernobyl to Baltic Sea ~4,100-5,100 TBq Cs-137 + 80 TBq Sr-90 (1991)
- 1/2 of Chernobyl Cs-137 in seabed; strongest accumulation first 5-6 years, ongoing process

Atmospheric atomic weapons tests

- tests significantly increased background radiation, partly single detections of bombs
- most tests carried out 1955-1958 + 1961-1962
- SU test site for instance Novaya Zemlya (130 tests)
- total depositions of weapons tests into Baltic Sea: ~900 TBq Cs-137 + ~600 TBq Sr-90 (1991)
- 1963: tests reduced; 1980: no atmospheric tests

Reprocessing units

- relevant impacts by Sellafield (UK) and La Hague (F) plants
- discharges of effluents containing numerous radionuclides to sea; peaks in 1970s + 1980s
- inflow to Baltic Sea through Danish Straits
- currently discharges decreased considerably

Nuclear facilities

- additional releases to Baltic Sea mainly by NPPs, fuel fabrication plants, atomic waste facilities, research facilities and military installations

Nuclear Power Plants

- **impacts** due to discharges to water and air; accident risk, require nuclear shipments
- **in operation**: 18 reactors (FIN, RUS, S)
- **closed**: 11 reactors (D, LT, S)
- **proposed**: 10 reactors (BY, FIN, LT, PL, RUS)
  - → replacements: 1 reactor (S)
- **construction**: 4 reactors (BY, FIN, RUS)

Atomic waste repositories

- **impacts** due to discharges to water and air; accident risk, require nuclear shipments; long-term safety issues
- **in operation**: 6 final repositories (EST,FIN,LV,PL,S) , 3 temporary repositories (D, PL, S) , 2 laborities (S)
- **proposed**: 4 final repositories (DK, FIN, RUS, S)
- 6 unclear repositories (LT)

Uranium mining and exploration

- **impacts** due to discharges to water and air; accident risk, require nuclear shipments
- **in operation**: 5 extraction facilities (FIN, S) , 1 (uranium) mine: (FIN)
- **exploration**: Finland (15), Russia(1), Sweden (~300)
- **closed**: 18 uranium mines (EST, FIN, PL, S) , 1 mill (PL) , 1 mill tailings storage (DK)

- **proposed**: 14 mines (FIN, RUS, S) , 1 extraction plant (FIN)
- **deposits**: Finland (54), Poland (8), Russia (2), Sweden (13)

Other facilities

- **impacts** due to discharges to water and air; accident risk, require nuclear shipments
- **in operation**: 3 research reactors (N, PL, RUS), 4 research & experimental sites (D, DK, PL, S), 4 other factories (FIN, RUS, S), 1 fusion reactor (D)
- **closed**: 20 research reactors (D,DK,EST,FIN,LV,N,PL,S)
- floating NPP „Akademik Lomonosov“ under construction (Saint Petersburg/RUS)

Atomic transports across Baltic Sea

- **impacts** due to accident risk; shipments via freighters and ferry lines
- **freights** include fuel elements, nuclear waste, uranium, UF6, partly next to explosives and other hazardous material
- **hundreds of shipments** every year including hazardous cargos

- **ship collision** hot spots: Kiel Canal (D), Skagerrak (DK), islands like Rügen (D), e.g.:
  - → 2013 „Atlantic Cartier“ fire in Hamburg – similar shipments operate in Baltic Sea
  - → 2013 „Mikhail Lomonosov“ collision with sailboat near Rügen island
  - → 2001 „Bugulma“ collision in Kiel Canal

New construction overview

- **NPPs**: 10-14 reactors (BY, FIN, LT, PL, RUS),
  1 reactor replacement (S)
- **repositories**: 4 final repositories (DK, FIN, RUS, S)
- **uranium plants**: 14 mines (FIN, RUS, S) ,
  1 extraction plant (FIN)
- **other facilities**:
  „Akademik Lomonosov“ floating NPP (RUS)

Atomic policies in Baltic Sea area and anti-nuclear movements

- Estonia
- (Belarus)
- Denmark
- Finland
- (Germany)
- Latvia
- Lithuania
- (Norway)
- Poland
- (Russia)
- Sweden

ATOMIC BALTIC campaign

network/project of anti-nuclear groups & activists in the Baltic Sea watershed, *including Austrian and Dutch organizations sharing their experiences and knowledge.*

Goals:

- → strengthening local anti-nuclear struggles
- → connecting activists to each other
- → starting up new initiatives
- → supporting campaigns against nuclear business

- ATOMIC BALTIC network/project provides a **platform for exchange** including internet tools, updateing Skype conferences and bimonthyl working meeting:

  http://AtomicBaltic.nuclear-heritage.net

- overall, ATOMIC BALTIC aims on **contributing to the worldwide** & immediate **shutdown** of all atomic facilities

- using the example of the Baltic Sea we want to raise **public awareness** and put **pressure on atomic industry** & decision makers

Conclusions

>60 atomic facilities in the Baltic Sea's watershed, **risky shipments** of radioactive material and the **historic impacts** of civil & military nuclear industry pose **serious threats** on people, other beings & environment.

All atomic installations must be **shut down immediately**, new projects have to be **cancelled**. The historic legacies require consequently **safety-orientated** handling.


Thank you
for your attention!

some valuable resources:

- **BSEP110.pdf –** *Long-lived radionuclides the seabed of the Baltic Sea (HELCOM)*
- **HazardousSubstances_MM2007.pdf –** *Towards a Baltic Sea unaffected by Hazardous Substances. HELCOM Overview 2007 (HELCOM)*
- http://www.greenworld.org.ru
- http://www.wise-uranium.org
- http://www.nuclear-waste.eu

external references:

- http://en.wikipedia.org/wiki/Greifswald_Nuclear_Power_Plant
- http://en.wikipedia.org/wiki/Nuclear_weapons_testing
- http://en.wikipedia.org/wiki/List_of_nuclear_reactors
- http://en.wikipedia.org/wiki/Nuclear_power_in_Russia
- http://en.wikipedia.org/wiki/Akademik_Lomonosov
- http://en.wikipedia.org/wiki/Leningrad_nuclear_power_plant